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THESIS

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AN ANALYSIS OF FACTORS AFFECTING THE
CAREER PLANS OF MILITARY NURSES

by

Elenor M. Shigley

December 1988

Thesis Co-advisors:

Benjamin J. Roberts
Kathryn Kocher

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An Analysis of Factors Affecting the
Career Plans of Military Nurses

by

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Lieutenant, Medical Service Corps, United States Navy
B.A., University of California, San Diego, 1979

Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

This thesis analyzes factors influencing a military nurse's decision to stay in or leave the service. Data used were from the 1985 Department of Defense Officer and Enlisted Personnel Survey conducted for the Office of the Secretary of Defense by the Defense Manpower Data Center (DMDC). The likelihood of leaving is examined using a logistic regression (logit) model with a dichotomous choice of decisions (leave/stay). The relative importance of various factors to the career decision is assessed. Factors identified in this study as significant in explaining the career decisions of a non-obligated, military nurse include grade, satisfaction with freedom, satisfaction with promotion, gender and race. The results highlight potential policy variables which can be impacted by manpower policy planners to manage nurse retention.

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I. INTRODUCTION

There appears to be a critical shortage of hospital nurses in the United States, despite a 15 year national effort to bring the supply of nurses into balance with increased demand. Careful review of supply and requirement data does not provide an adequate explanation for the persistent shortage, and common misconceptions about the nature of the nurse shortage have clouded the debate. [Ref. 1]

The Division of Nursing of the American Hospital Association recognizes a significant three-year decline in enrollment in nursing education programs across the country, including hospital schools of nursing, associate degree programs, and baccalaureate and master's level programs. This decline in enrollment affects the availability of nurse professionals in the hospital setting. [Ref. 2]

The Navy has put nurses on 12-hour shifts in naval hospitals to cope with a growing shortage of nurses. Nursing directors say they will try to simplify patient record keeping, adopt more flexible work schedules and present more awards for outstanding performance in an effort to make Navy military nurses happier--and perhaps slow their exodus from the service. [Ref. 3]

Several nurses interviewed at Fitzsimons, the Army's second largest self-sustaining hospital, stressed that the care of patients has not been compromised during the nursing crunch, but that the nurse shortage has made life difficult for many of them. The nurses there indicate that they're working twice as hard and that this creates a very high level of stress. The strain is particularly dramatic for those who wear the Army uniform because military hospitals must pay overtime to the civilian nurses but not to nurse officers. Nurse officers are asked to work the extra hours when necessary. [Ref. 4]

The above facts are but a few of the many reflections of an undersupply of nurses affecting both the civilian and military hospitals across the nation. Competition to lure nurses is increasingly difficult.

Overall, the nursing shortage affects both the quality and quantity of patient care provided. A nurse's decision not to stay in the military is costly in money, personnel, command morale, and force readiness.

The military incurs substantial costs in recruiting and training military nurses. Recruiting costs include all costs involved in advertising, screening applicants to evaluate their qualifications, and processing successful applicants. The invested cost of training those who leave is yet another expense. Training costs include the explicit monetary costs of the trainers and the costs of materials

used during the training process, the opportunity costs of the trainee's time, and the opportunity costs of using capital equipment and experienced personnel to do the training. [Ref. 5]

Force readiness is also a victim of a military nurse's decision not to stay. When there are not enough experienced military nurses available to carry out the hospital's mission, the effectiveness of the service is diminished and the quality of medical care declines. Thus, if retention falls below planned levels, force readiness may be impaired even with adequate recruiting.

The factors that influence a military nurse to remain in uniform vary and are dependent on the external economic environment and the individual's reservation wage. Policy changes in areas such as promotion opportunities, working conditions, and special benefits greatly affect the attractiveness of the military compared to the civilian occupations and lifestyles. The relative value of the military career differs when these policy changes affect the intrinsic components like satisfaction, personal freedom and job challenge; extrinsic components such as pay, duty assignments and job benefits; and demographic components such as marital status, age, and education.

The military nursing shortage is symptomatic of the overall nurse shortage which is a result of relatively new opportunities for nurses to work in a wide variety of career

fields. Low status, bad working hours and low pay traditionally associated with nursing all are factors contributed to the decline of women entering the profession. Because of the shortage, salaries for civilian nurses have been rising and hospitals and nursing services are offering innovative work schedules and other inducements to attract nurses. The military has lagged and as a result, many military nurses have decided to leave the service. New nurses entering the profession today can expect reasonable compensation because of the expressed shortage and the increased competition between hospitals and other health agencies for their services. [Ref. 6]

Women in managerial positions define the concept of career differently than men. Women view a career from a psychological perspective related to personal growth and making a contribution to others, whereas men are advancement oriented. [Ref. 7]

As a predominantly female profession, nursing displays the above female characteristics. Nurses have been concerned with a job switch when dissatisfaction sets in; however, a job change may not have always led to advancement or professional development. [Ref. 7]

The factors which affect the career decision of a nurse to leave the military, a predominantly female group, should be of interest to military health care planners.

The purpose of this thesis is to formulate a model which will examine and identify significant factors that influence a military nurse's decision to stay in or leave the service.

In conducting this study, the major research question asked is: What factors influence a military nurse's decision to stay in or leave the service?

This thesis does not attempt to prescribe the answers for military hospitals in coping with their individually unique situations, but provides both qualitative and quantitative information that can assist health care planners in making decisions on recruitment and retention efforts appropriate to them. The objective of this thesis is to analyze the factors relevant to the military nurse's career decisions.

This thesis will examine data from the 1985 Department of Defense (DOD) Survey of Officer and Enlisted Personnel to determine the factors affecting the retention and attrition of military nurses.

II. LITERATURE REVIEW

A. BACKGROUND

Numerous studies and data analyses have examined personnel retention in the military services. With rare exception these studies have been devoted solely to male enlisted and officer retention behavior. Very few have shed any light on female behavior. Even fewer studies have examined the retention of military nurses, and only a handful of studies in recent years have investigated factors surrounding the military nurse's decision to remain in or leave the service. Most of the results of the research done with civilian nurses can be generalized to the military nurse population, but the unique factors found only in military life must be considered.

Recent literature focused on nurse supply has appeared in response to the last nurse shortage, which took place in the late 1970s and through the early 1980s. Between 1982 and 1985, the literature reflected concerns about the decline in the length of stay for in-hospital patients, a response predominantly due to changes in Medicare coverage. The press gave fanfare to hospital contraction or closure with news headlines decreeing hospital staffs laid off. This was widely interpreted as nurses laid off which

prompted the question of what, if any, future job opportunities would be available to nurses. [Ref. 8]

As late as July 1986, many experts in the medical field still believed there was "no nursing shortage" and stated that, at present, the supply seems to be adequate. By the spring and summer of 1986, the conventional wisdom had quickly made an about face. Reports of nurse shortages appeared increasingly frequently in the American Journal of Nursing (AJN) addressing the dwindling supply of nurses prepared in critical care areas. The AJN further painted a broad picture of growing concern about future shortages throughout the country. [Ref. 2]

Declining enrollments in all types of nursing education programs exacerbated by cuts in federal aid for nursing education down from \$150 million in 1974 to \$46.6 million by 1982 started making the news. In addition, nurse educators acknowledged with growing concern the declining academic qualifications of prospective nursing students. There was no denying that nursing was still very hard work, but with new emphasis on cost containment in health care requiring expertise in the high-tech, high-touch work world of the average hospital, nurses would have to cope with even more stress. [Ref. 7]

An immediate remedy of improved financial rewards for experienced members of the nursing staff was thwarted considering the large number of nurses in any hospital and

the colossal long-term impact of substantial increase in their salaries.

With what is presently known about the increasing demand for nurses in hospitals, the bleak dimensions of the nursing shortage start to take shape as a very complicated long-term problem.

B. BRANCH OF SERVICE

The Department of Defense provides nursing services for the Army, Navy, and Air Force through their respective Nurse Corps. These corps have several common characteristics. Military nurses tend to be career oriented. Many opportunities exist for real advancement. The services offer professional opportunities which include innovative programs and policies, mechanisms for peer review, and collaborative practice models.

Disaster planning and the ability to respond rapidly to contingency disasters are especially unique attributes of the military nurse. The progressive activities of each branch of the military services in assisting nurses to achieve and practice professional nursing are mutually reinforcing and have become a standard for the private sector as well.

The three nurse corps and their reserve units have a common mission. That mission is to assure and preserve the health and well-being of military forces and to ensure a ready reservoir of competent, highly trained professionals

to support contingencies, mobilization, and combat operations.

A brief description of each of the services is outlined with emphasis on the history, mission, personnel, and some of the significant programs.

1. Army Nurse Corps

The Army Nurse Corps was established in 1901. The foundation of the Corps was built on the service of contract nurses for the Army during the Spanish-American War of 1898. The mission of the Army Nurse Corps include:

- 1) Providing comprehensive and quality nursing services in accordance with defined standards of nursing practice to eligible beneficiaries in hospitals, outpatient clinics, and community settings.
- 2) Assisting in education and training of enlisted personnel, licensed practical nurses, nursing assistants, and medical technicians, and providing continuing education opportunities for professional nurses to maintain competency and currency of practice in their military occupational specialty or specialty skill identifier.
- 3) Establishing and maintaining a current and dynamic professional nursing system that is an incentive for recruitment and retention of professionally qualified nurses. [Ref. 7]

The active duty corps strength is approximately 4,000. Educationally, 98.8 percent have a minimum of a bachelor's degree. Further, 19.6 percent have earned master's or doctorates in clinical nursing practice, education, research, and administration. The Army Nurse Corps is augmented by a civilian nurse staff of approximately 2,400. There are approximately 887 nurses in

the National Guard and 4,217 in the troop units of the U.S. Army Reserve, with an additional 1,924 in the Individual Ready Reserve. [Ref. 7]

Improving nursing practice in the Army Nurse Corps remains a high priority. Educational endeavors and the continued growth of nursing personnel continue to receive attention. The Walter Reed Army Institute for Nursing (WRAIN) program, based at the University of Maryland School of Nursing, provides graduates of this program a commission in the corps. Of equal importance has been the developing relationship between the Army Nurse Corps and Bachelor of Science Nursing Programs in which nursing students participate in the Reserve Officer Training Corps (ROTC). The ROTC nursing cadets are exposed to the actual daily nursing responsibilities in wards and clinics. [Ref. 7]

2. Navy Nurse Corps

The Navy Nurse Corps was established in 1908. Its primary mission includes providing professional nursing care to and promoting the health of Navy and Marine Corps personnel, their dependents, and others as authorized by law. In addition, the Corps provides instruction and supervision of Hospital Corps personnel in the theory and practice of nursing care. [Ref. 7]

There are 2,864 Navy Nurse Corps officers who serve in over 100 locations including overseas stations, on aircraft carriers, and with the Fleet Support Groups (FSSG).

Approximately seven percent of these nurses work in the expanded clinical roles of anesthetist, family practitioner, pediatric practitioner, obstetrics and gynecology (OB/GYN) practitioner, and midwife. [Ref. 7]

Navy nurses are all professional registered nurses. Over 80 percent of them possess at least a baccalaureate degree, and approximately ten percent hold a master's or higher degree. The minimal educational requirement for the Nurse Corps is graduation from an accredited diploma nursing program. [Ref. 7]

There have been several changes in the characteristics of the Navy Nurse Corps. Initially, nurses were neither Naval officers nor enlisted members. Then in 1942, Navy nurses were appointed as officers. Male nurses were accepted as officers in the Corps in 1965. [Ref. 7]

Notably unlike the two other services, the Navy has, as of this writing, no scholarship or student incentive programs. NROTC midshipmen can not be guaranteed a nursing career in the Navy.

3. Air Force Nurse Corps

The National Security Act of 1947 established the United States Air Force as a separate service. Two years later in 1949, the Medical Service, including the nursing component, was established. The Nurse Corps was formed with 1,199 Army nurses who transferred to the Air Force. The Air

Force Nurse Corps is an integral component of the U.S. Air Force Medical Service. The mission of the Corps include:

- 1) Providing nursing services in support of the Air Force medical mission.
- 2) Providing comprehensive nursing care in a variety of specialties and settings--inpatient, ambulatory care, and aboard aeromedical airlift missions.
- 3) Participating in maintaining a high level of wellness among Air Force beneficiaries through establishing and coordinating health education programs, teaching principles of health to patients and family members, and monitoring work areas for occupational safety.
- 4) Teaching and supervising clinical activities of nonprofessional personnel involved in patient care.
- 5) Participating in nursing research. [Ref. 7]

Currently there are 4,480 nurses in the Air Force Nurse Corps. All are commissioned officers. These nurses are assigned in areas such as administration, clinical nursing, mental health, operating room, anesthesia, education, OB/GYN practitioner, pediatric nurse practitioner, flight nursing, mid wifery, and environmental health nursing. Eighty percent of the nurses in the Air Force have a minimum of a baccalaureate degree. In addition, to the active duty force, 2,265 nurses are assigned to the Air Force Reserves and 500 nurses to the Air National Guard. [Ref. 7]

There are several unique programs that the Corps provides to their nurses which include:

- 1) United States Air Force Nurse Internship Research Study--This program is designed for the registered nurse who is a recent baccalaureate graduate with no or limited clinical experience. The primary focus of

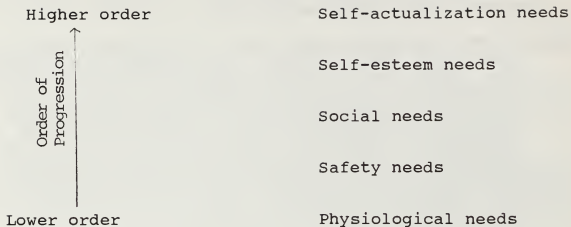
this program is the practical application of theory in a medical-surgical inpatient setting under the guidance of an experienced clinical nurse preceptor.

- 2) Flight Nurse--The Air Force Aeromedical Evacuation System has revolutionized the transport of patients. This type of nursing requires indepth clinical knowledge as well as awareness of the effects of altitude on patients with a variety of injuries or illnesses. This system is responsible for the reduction of morbidity and mortality of battlefield casualties. Flight nurses have been instrumental in designing special equipment as well as assisting with the interior design of the first aircraft used specifically for patient airlift.
- 3) Environmental Health Nurse--This specialty is one of the most diversified and varied within the nursing profession. These nurses perform independently and as members of a multidisciplinary health team, comprising nurses, physicians, bioenvironmental engineers, safety engineers, laboratory, and x-ray personnel. [Ref. 7]

C. TURNOVER

There are a number of articles regarding the subject of civilian turnover. However, just knowing that an employee is dissatisfied and decides to leave an organization does not give much insight into why he/she is dissatisfied.

Maslow's need hierarchy theory gives a good base from which insight into the basic factors of human motivation can be gained [Ref. 9]. Maslow proposes five types of needs as illustrated in Figure 2-1: physiological and safety needs (referred to as basic) and social, self-esteem, and self-actualization needs (referred to as higher-order needs). The military in general does a fairly good job of satisfying the physiological needs and most other basic needs. The higher order needs are more pertinent to this analysis.



Source: [Ref. 9]

Figure 2-1 Maslow's Need Hierarchy

According to Maslow, there are three propositions for progression through needs:

- 1) Once a need is fulfilled, it will no longer motivate behavior.
- 2) A person will progress through the needs in order, moving on to the next one only after the preceding one has been fulfilled.
- 3) The needs basic to survival always have a higher priority. [Ref. 9]

Herzberg's two-factor theory describes a set of extrinsic and intrinsic factors which contribute to human motivation [Ref. 9]. Extrinsic factors such as salary, working conditions, job security, status, supervision, procedures and interpersonal relationships cause dissatisfaction when not present; but do not necessarily lead to high satisfaction when present. Conversely, intrinsic factors like achievement, responsibility,

advancement and recognition are strong motivators when present; and do not normally contribute to dissatisfaction when absent.

Thus, a relationship between Maslow's and Herzberg's theories can be found in an individual's career decisions since once an individual satisfies lower level needs, the individual will strive to satisfy high level intrinsic needs.

The job characteristics model proposed by Hackman and Oldham (1976) explained how jobs influence attitudes and behaviors. According to Hackman and Oldham, any job can be described by five core dimensions:

- 1) The number of different activities, skills and talents the job requires.
- 2) The degree to which a job requires completion of a whole, identifiable piece of work, that is, doing a job from beginning to end with visible results.
- 3) The job's impact on the lives or work of other people, whether within or outside the organization.
- 4) The degree of freedom, independence, and discretion in scheduling work and determining procedures that the job provides.
- 5) The degree to which carrying out the activities required results in direct and clear information about the effectiveness of performance. [Ref. 9]

The second part of their model dealt with the effects job dimensions had on individuals and their influence on three critical psychological states suggesting that a job must:

- 1) Allow workers to feel personally responsible for a meaningful portion of their work.

- 2) Provide work outcomes that are intrinsically worthwhile.
- 3) Provide feedback on performance effectiveness. [Ref. 9]

High levels of these critical psychological states would lead to favorable personal and work outcomes including high internal motivation, work performance and satisfaction, and low absence or turnover. In other words, the harder and better an individual works on a job, the more opportunities he/she will have to experience higher order need satisfactions and the more incentive he/she will have for continued effective performance.

Organizational commitment and turnover were studied by Porter, Crampton, and Smith (1986). Their results indicated that those who voluntarily left the organization during the study period had begun to show a decline in their commitment prior to actually leaving. They concluded that in the event a marked decline in commitment started to occur, it was most likely signaling a voluntary termination in the near future. [Ref. 10]

Werbel and Gould (1984) used tenure as the moderating variable in determining the relationship between organizational commitment and turnover. Their findings showed that during the first year of employment, no relationship existed between commitment and turnover. However, as the amount of tenure increased, an inverse

relationship between commitment and turnover became more apparent. [Ref. 10]

Koch and Rhodes (1981) found that organizational, job, and personal characteristics were equally important in the explanation of turnover of female factory workers. The significant variables related to turnover were tenure, satisfaction with pay and family income . Personal factors which were not significantly related to turnover included education level, age and training status. [Ref. 10]

According to Mobley (1982), the one best indicator of turnover is an employee's stated decision to quit. Other consistent factors which appear in the literature include pay, age, satisfaction with job and organizational commitment. Less consistent factors leading to turnover are managerial style, autonomy and responsibility, family responsibility, and satisfaction with pay, promotion and coworkers. [Ref. 10]

Other studies list "personal reasons" as the possible cause of voluntary turnover; however, each author seems to give his/her own definition of "personal" (i.e., marriage, pregnancy, family responsibility, education pursuit, etc.) It has also been said that nursing turnover could be related to the conflict between the role of having a career as a nurse, or being a wife or mother; however, few studies have touched the issue of gender to a great degree. Along the lines of satisfaction, the extrinsic factors (pay, duty

assignments and job benefits, etc.) are cited as possible correlates of turnover, and in addition, the demographic factors (marital status, age, education, etc.) have also been found to have a large impact upon turnover. [Ref. 10]

Thus far the review of the literature on turnover as it relates to nursing indicates that satisfaction and an individual's decision to leave have the strongest correlation to turnover. Therefore, further study should concentrate on these two areas.

D. PREVIOUS STUDIES OF CIVILIAN NURSE RETENTION

In order to begin to understand the complexities of the issues that have led to the current nurse shortage, it is necessary to look into the thought, opinion, and actions affecting the civilian nurse supply.

In a 1976 study examining why college graduates chose nursing, several conclusions suggested that the then typical high-school graduate who chose to apply to a baccalaureate nursing program wanted to be part of a helping profession, was well informed about the options for educational preparation, had experience in health care, and planned to take advanced study after completion of an interval of nursing practice. [Ref. 2]

Current trends show difficulty attracting young people into the fields requiring a high level of idealism. Nursing as well as school teaching both fall into a difficult

position when attempting to market to this shrinking audience. [Ref. 2]

A study conducted by Burton and Burton (1982) on job expectations of senior nursing students shows:

- 1) Nursing graduates look for good salary.
- 2) Nursing graduates look for the opportunity to work a desired shift in a desired specialty.
- 3) Nursing graduates look for pleasant working conditions. [Ref. 11]

Also seen as important were the opportunity for promotion and advancement and the high professional reputation of the institution.

According to Weisman (1982), the major conclusion from research in nursing turnover is that dissatisfaction with hospital jobs is the major reason why staff nurses leave. In addition, dissatisfaction centers around the dual issues of nursing control and career opportunities. The nurse's perceived autonomy, including the ability to make decisions on work conduct, is the strongest predictor of job satisfaction. Job satisfaction on the other hand, is the strongest predictor of whether a nurse stays on the job. The other factor that influenced job satisfaction levels, job hunting, and the decision to stay in the job or leave were primarily job-related variables. Marital or family status in this study did not exert any significant influences. [Ref. 12]

Gaertner (1984) examined the literature regarding employment patterns for women, and the role conflict situation in which attraction to work is offset by attraction to child-rearing and domestic responsibilities. Gaertner refers to a body of literature suggesting that job satisfaction contributes to commitment through five key characteristics:

- 1) The variety of skills required by the job.
- 2) The extent to which the work is perceived as important.
- 3) Whether feedback is available from the work itself.
- 4) The amount of autonomy in determining the way in which the work is done.
- 5) The extent to which the work is seen as a whole rather than a fragment. [Ref. 13]

Other references cited by Gaertner indicate that the labor force participation pattern of nurses has several important aspects which include:

- 1) The one motivation that tends to be lasting in nursing is autonomy.
- 2) Nurses caught between the demands of job and family are opting for family when there is freedom to do so.
- 3) Flexibility and scheduling are not the greatest source of dissatisfaction by any means, but are the largest correlates of employment status and reasons given the most importance for leaving nursing.
- 4) Results indicate that nurses like to "nurse"--their greatest sources of job satisfaction are patient care and working with colleagues. [Ref. 13]

E. PREVIOUS STUDIES OF MILITARY NURSE RETENTION

A study by the U.S. Army (1978) was conducted to identify those factors which Army nurse clinicians perceived to affect their job satisfaction and retention on active duty. The subjects in the pilot study were divided into a clinician care group and a staff nurse or control group. The individuals in the clinician group were identified by the chief nurses of the medical treatment facilities and were composed of Army Nurse Corps officers and civilian professional nurses working in an extended nursing role. The control group were composed of individuals who were working in nursing service staff positions and were selected by the chief nurses of the medical treatment facilities to match the clinician group. A total of 472 questionnaires were sent out with 376 responding. Statistical analysis and review of responses to the extensive questionnaire resulted in the following major findings:

- 1) The majority of responses from all subjects indicated few differences between the clinicians and staff nurse control groups.
- 2) The clinicians expressed greater satisfaction regarding their work situations and indicated they were well utilized in their jobs.
- 3) Dissatisfactions were few and concerned adequacy of nursing supervision of the clinicians.
- 4) There were no differences between the two groups as to why individuals would leave or stay in the Army.
- 5) There was an indication within the clinician group that members might stay on active duty but not until retirement. [Ref. 14]

The clinicians appeared to believe there were a greater variety of jobs for them in the civilian community than in the military. They expressed concern about their insecurities in being able to remain in a clinician role and not having to move into administration which they felt would occur with promotions. Similar comments were made by the staff nurse group who expressed fears of being placed in jobs for which they were not prepared or being required to move beyond the head nurse role. [Ref. 14]

A Navy study (1984) was conducted to investigate whether the perception of alternative job factors affected the career orientation of Navy Nurse Corps officers in both their initial and non-initial period of service obligation. The data were derived from the 1978 Department of Defense Survey of Officer and Enlisted Personnel conducted by the Rand Corporation. The study divided survey respondents into career orientation groups according to years of service intended and the groups were homogeneous with respect to demographic and current job characteristics. Stepwise discrimination analysis was performed to select the set of alternative job attributes which best discriminated between each career orientation group. Some of the major results of this study include:

- 1) For the most part, the perceptions of alternative job comparisons are different for the groupings within and between the tenure groups.

- 2) A military nurse prefers to have a job which she perceives as interesting and challenging or she may leave the organization.
- 3) Supervisors, salary, and medical benefits are most important for those nurses in their initial obligation, whereas training opportunities are more important in the career intention decisions of nurses who are not in an initial service obligation. [Ref. 15]

A recent study (1987) identified U.S. Air Force Nurse Corps officers at risk for turnover, how satisfaction impacts on turnover, the impact of work Role Design and Individual Motivation on satisfaction, and the stated reasons for turnover. A descriptive study design was utilized using a questionnaire for data collection designed by Seybolt (1983,1986). The questionnaire was used to gather information pertinent to assessing the nurse's turnover intentions and levels of satisfaction. The population for this research consisted of 5,124 nurses on active duty in the U.S. Air Force, assigned worldwide. An attitude questionnaire was utilized to determine the individual's turnover intentions, level of satisfaction, mobility, motivating potential, interaction, consistency and equity of policies, valence of performance, role perceptions, and perceived equity of rewards. In addition, open-ended questions were used to determine stated reasons for leaving or staying. Major findings include the following:

- 1) Demographic characteristics of age, sex, marital status, rank, time of station, and time in Air Force,

and level of Air Force satisfaction had an effect on turnover intentions.

- 2) Consistency and equity of organizational policies and the motivating potential were the most important work role design factors in determining satisfaction.
- 3) Equity of rewards was the most important individual motivator.
- 4) Stated reasons for turnover were related to working conditions, politics, the job, family responsibilities, supervision, and policies.
- 5) Reasons for staying were related to the job, benefits, politics/policies, educational opportunity, and personal reasons. [Ref. 10]

III. DATA AND METHODOLOGY

A. SURVEY DESCRIPTION

The data used for this study were from the 1985 Department of Defense Survey of Officer and Enlisted Personnel conducted for the Office of the Secretary of Defense by the Defense Manpower Data Center (DMDC). This survey was conducted to create a single cross-service database for studying military personnel and their families and to assess the impact of policies implemented in the past few years. An explicit objective of the survey was to be able to study the factors affecting readiness and retention of active duty personnel, career orientations, and how attitudes and experiences differ between members of different subgroups. [Ref. 16]

The major sections of this survey included:

- 1) Military information.
- 2) Present and past locations.
- 3) Reenlistment/career intentions.
- 4) Individual and family characteristics.
- 5) Military compensation, benefits, and programs.
- 6) Civilian labor force experience.
- 7) Family resources.
- 8) Military life.

These sections comprised a total survey consisting of 209 officer questions.

B. CHARACTERISTICS OF THE MILITARY NURSE POPULATION

In order to provide a framework for better understanding of attrition and retention within the military nurse population, all nurses in the survey sample, including those who left the service in FY87, were categorized according to individual characteristics. A frequency analysis of each factor was conducted to provide a reference point and overview of the sample data prior to the estimation of the LOGIT model [Ref. 17]. The following nurses were omitted from the sample in order to obtain a cohort of non-obligated nurses:

- 1) Nurses who had an obligation to remain in the military.
- 2) Nurses who retired from active duty in FY87.
- 3) Nurses who had less than 4 years or greater than 14 years of active duty service.
- 4) Nurses who were grades 0-5 and above.

1. Branch of Service

Table 3-1 illustrates the distribution of nurses by branch of service. The Air Force comprise the largest category in this data sample.

2. Leavers and Stayers

The decision to stay in or leave the military would be difficult to analyze without a method of determining those nurses serving on active duty under obligation.

TABLE 3-1

NON-OBLIGATED NURSES BY BRANCH OF SERVICE

<u>Service</u>	<u>Frequency</u>	<u>Percent</u>
Army	172	31.2
Navy	161	29.2
Air Force	218	39.6

Removing obligated nurses from the sample leaves a cohort that was free to depart the military or remain on active duty in FY87.

Table 3-2 shows the number and percent of non-obligated nurses who left the military by branch of service in FY87.

TABLE 3-2

STAYERS AND LEAVERS BY BRANCH OF SERVICE
(NON-OBLIGATED NURSES)

	Army	Navy	Air Force	Total
Stayers	143 83%	138 86%	178 82%	459
Leavers	29 17%	23 14%	40 18%	92
Total	172	161	218	551

3. Grade

Nurses receive credit for promotion purposes for time spent in graduate nursing school programs and/or civilian practice or experience. Table 3-3 provides a

matrix of all military nurses by grade and service. Removal of obligated officers from this cohort in Table 3-4 indicates that the paygrade with the highest percentage of losses are the O-3's.

TABLE 3-3

GRADE BY BRANCH OF SERVICE
(TOTAL NURSES)

	Army	Navy	Air Force	Total
O-1	31 8%	42 12%	39 8%	112
O-2	47 12%	39 11%	66 14%	152
O-3	152 39%	137 39%	233 50%	522
O-4	119 30%	89 25%	95 20%	303
O-5	32 8%	35 10%	29 6%	96
O-6	10 3%	11 3%	7 2%	28
Total	391	353	469	1213

TABLE 3-4

STAYERS AND LEAVERS BY GRADE
(NON-OBLIGATED NURSES)

	O-1	O-2	O-3	O-4	Total
Stayers	2 67%	4 100%	276 78%	177 94%	459
Leavers	1 33%	0 0%	80 22%	11 6%	92
Total	3	4	356	188	551

4. Length of Service

An officer's grade and commissioned length of service are generally closely correlated. As previously noted, nurses can be an exception due to creditable service time given for advanced education and civilian experience. Length of service is meaningful (independent of grade) in measuring a nurse's military experience.

Table 3-5 divides this cohort into nurses remaining in service and those who left the military in FY87. Losses were relatively constant through the first four years of service. The peak losses for the non-obligated nurse cohort appear to occur at the fifth year of service.

5. Reserve Participation of Prior Service Nurses

Most nurses enter the military service as a reserve officer on active duty. Two years after the completion of service, a nurse may apply for augmentation into the regular military. Acceptance into the regular military involves a two year commitment and is therefore indicative that an officer intends to remain in the military for at least several years. Unfortunately, a method to remove those nurses obligated by augmentation in the data could not be devised.

Table 3-6 indicates that of the nurses who left the military, approximately 82 percent joined the reserves.

TABLE 3-5

STAYERS AND LEAVERS BY LENGTH OF SERVICE
(NON-OBLIGATED NURSES)

	4 years	5 years	6 years	7 years	8 years
Stayers	49 80%	45 65%	47 83%	44 83%	33 75%
Leavers	12 20%	24 35%	10 17%	9 17%	11 25%
Total	61	69	57	53	44
	9 years	10 years	11 years	12 years	13 years
Stayers	34 90%	51 85%	38 84%	35 92%	45 94%
Leavers	4 10%	9 15%	7 16%	3 8%	3 6%
Total	38	60	45	38	48
	14 years	15 years	Total		
Stayers	37 100%	1 100%	459		
Leavers	0 0%	0 0%	92		
Total	37	1	551		

TABLE 3-6

STATUS OF STAYERS AND LEAVERS
(TOTAL NURSES)

<u>Status</u>	<u>Frequency</u>	<u>Percent</u>
Stayers	459	82.1
Leavers--Joined Reserves	82	14.7
Leavers--Did not join Reserves	10	1.8
Leavers--Retired	8	1.4

6. Race, Gender

Race and gender have been shown to be significant determinants of retention in many previous studies of reenlistment behavior. Table 3-7 shows that 87 percent of all nurses are white while Table 3-8 illustrates that 11 percent of all nurses are male.

TABLE 3-7
TOTAL NURSES BY RACE

<u>Race</u>	<u>Frequency</u>	<u>Percent</u>
White	1056	87.1
Non-white	157	12.9

TABLE 3-8
TOTAL NURSES BY GENDER

<u>Gender</u>	<u>Frequency</u>	<u>Percent</u>
Female	1086	89.5
Male	127	10.5

Removing obligated nurses from the sample in Tables 3-7 and 3-8 reveals that 17 percent of the whites and 13 percent of the non-whites departed the military in FY87; whereas 18 percent of the females and 9 percent of the males departed the military.

TABLE 3-9

STAYERS AND LEAVERS BY RACE
(NON-OBLIGATED NURSES)

	White	Non-white	Total
Stayers	393 83%	66 87%	459
Leavers	82 17%	10 13%	92
Total	475	76	551

TABLE 3-10

STAYERS AND LEAVERS BY GENDER
(NON-OBLIGATED NURSES)

	Female	Male	Total
Stayers	399 82%	60 91%	459
Leavers	98 18%	7 9%	92
Total	485	66	551

7. Marital Status, Dependents

A nurse's marital status and family may influence his/her decision to remain in the military. Married officers and officers with dependents may be more risk adverse than single officers and officers with no dependents when deciding to depart the military for a civilian career due to financial concerns surrounding family commitments. As shown in Tables 3-11 and 3-12, single nurses compose 50 percent of all nurses, whereas nurses with no dependents

compose 64 percent of all nurses. Tables 3-13 and 3-14 for non-obligated nurses indicate that approximately 17 percent of single and 16 percent of married non-obligated nurses departed the military in FY87 and 17 percent of nurses with no dependents and 16 percent of nurses with one or more dependents departed the military in FY87.

TABLE 3-11

TOTAL NURSES BY MARITAL STATUS

<u>Marital Status</u>	<u>Frequency</u>	<u>Percent</u>
Single	609	50.2
Married	604	49.8

TABLE 3-12

TOTAL NURSES BY DEPENDENTS

<u>Dependent Status</u>	<u>Frequency</u>	<u>Percent</u>
No Dependents	775	63.9
Dependents	438	36.1

TABLE 3-13

STAYERS AND LEAVERS BY MARITAL STATUS
(NON-OBLIGATED NURSES)

	Single	Married	Total
Stayers	182 83%	277 84%	459
Leavers	38 17%	54 16%	92
Total	220	331	551

TABLE 3-14

STAYERS AND LEAVERS BY DEPENDENTS
(NON-OBLIGATED NURSES)

	No Dependents	Dependents	Total
Stayers	251 83%	208 84%	459
Leavers	53 17%	39 16%	92
Total	304	247	551

8. Overview

Thus far in review of the characteristics of non-obligated, military nurses, the turnover rate was fairly low (17%). This may indicate that nurse turnover is not a major problem for the military. Replacement is the key here. A loss of 17% which is not made up by recruitment could certainly strain military nursing resources. With the current attrition rate in the civilian sector and the reported increase in military nursing shortage, the potential for an increase in turnover exists. Thus, the problem is how to identify those factors that tend to cause military nurses to leave and institute appropriate policies before a major problem develops.

C. VARIABLE SELECTION

Out of the total 209 questions, variables were selected based on previous research (literature review). The variable selection decisions for this study were based upon

the theories of Maslow and Herzberg as described in Chapter II. The "hierarchy of needs" and the "two factor" theories supported the hypothesis that job satisfaction is an important factor in determining the career decisions of a military nurse.

The survey response used to develop the dependent variable was STATUS. STATUS was used to form the dichotomous variable, LEAVERS (i.e., decision not to make the military a career), by coding the responses into two groups representing: LEAVERS and STAYERS.

D. EXPLANATORY VARIABLES

Some of the explanatory variables selected were dichotomous variables, coded 1 if the condition holds and 0 if it does not. Table 3-15 lists all the independent variables considered in this study.

Table 3-16 lists the candidate variables used in the model and their hypothesized coefficient signs.

A higher grade reflects greater work opportunities and more pay and therefore should have a negative effect on a nurse's decision to leave the military.

Being a male would be expected to have an inverse relationship to the decision to leave the service. Males have shown a greater propensity to stay in the service compared to females.

An individual's race would have an effect on the decision to remain in or leave the service. For non-whites,

TABLE 3-15

INDEPENDENT VARIABLES CONSIDERED FOR THE MODEL

<u>Variable</u>	<u>Survey Index Number</u>
BRANCH OF SERVICE	O3E3
* RACE	O39E38
GRADE	O5E5
LENGTH OF SERVICE	O9
* MARITAL STATUS	O51E48
* GENDER	O35E34
EDUCATION	O45
* DEPENDENTS	O67E64
SATISFACTION WITH PERSONAL FREEDOM	O109105A
SATISFACTION WITH WORK GROUP	O109105C
SATISFACTION WITH PAY & ALLOWANCES	O109105E
SATISFACTION WITH JOB SECURITY	O109105M
SATISFACTION WITH PROMOTION OPPORTUNITIES	O109105K
SATISFACTION WITH JOB TRAINING/ IN-SERVICE EDUCATION	O109105L
* Dichotomous Variables	

TABLE 3-16

HYPOTHESIZED SIGNS OF EXPLANATORY VARIABLES

<u>VARIABLE</u>	<u>HYPOTHESIZED SIGN</u>
GRADE	-
MALE	-
NONW	-
CHILDREN	-
MARRIED	-
FREEDOM	+
PAY	+
PROMOTE	+
-	less likely to leave the military
+	more likely to leave the military

the decision to stay is greater than that of whites.
Although the percentage of non-whites in the nursing

population is small, career opportunities are probably better in the service compared to the civilian sector.

Marriage and having children should have a negative effect on a nurse's decision to leave the service due to concerns for family responsibility.

Greater dissatisfaction with freedom, pay and promotion should have a positive effect on a nurse's decision to leave the service because of dissatisfaction with stringent regulations concerning personal freedom, lower pay and slow promotion rates (than in the civilian sector).

E. METHODOLOGY

The method used in analyzing the career decisions of military nurses is the LOGIT technique. The LOGIT technique was chosen because the dependent variable is restricted to two values--either a nurse will not stay in the military (1) or the nurse will stay in the military (0). The model was designed to estimate the effect that a number of variables had on a nurse's decision to stay or leave.

The method used in constructing these probabilities estimates the individual probability of a nurse leaving the military given individual characteristics X_{ij} [Ref. 18]:

$$P_i = \frac{1}{1 + e^{-e(a + \sum b_{ij}x_{ij})}}$$

where:

- P_i = the probability of the i th nurse leaving the military;
- a = the intercept derived from the logit regression analysis;
- b_{ij} = the coefficient of the i th explanatory variable;
- x_{ij} = the value of the j th explanatory variable for individual i .

The career decision probabilities associated with a reference individual were used to calculate the partial effects of a change in an explanatory variable. Such changes can be calculated as the difference between the alternative value of an explanatory variable when compared to the reference individual, while all other explanatory variables remain constant. [Ref. 18]

IV. RESULTS OF LOGIT ANALYSIS

A. EMPIRICAL ANALYSIS

Appendix A presents the mean values for estimated variables used in the LOGIT model. As noted in Chapter III, potential cohorts were omitted leaving a sample of non-obligated nurses. Among this cohort of stayers and leavers, the average grade was Lieutenant and length of service was approximately five years.

Appendix B shows an "R" of .278 for the model estimation. This denotes the explanatory ability of the variables to indicate whether a nurse will stay in or leave the military. "R" has a value of 0 if the model is of no value and 1 if the model predicts perfectly. "R" is the proportion of log-likelihood explained in the model.

The Beta coefficients were examined. These coefficients were viewed in terms of their relative sign rather than their absolute size. Positive coefficients indicated "more likely to leave" while negative coefficients suggested "less likely to leave" the military. Table 4-1 lists the actual signs of the variables.

A review of the P-values associated with each variable indicates the significance of the estimated coefficient of the explanatory variables. The more significant (lower) the P-value, the more confidence can be associated with the

TABLE 4-1

ACTUAL SIGNS OF EXPLANATORY VARIABLES

<u>VARIABLES</u>	<u>ACTUAL SIGN</u>
GRADE	-
MALE	-
NONW	-
CHILDREN	+
MARRIED	+
* FREEDOM	+
PAY	-
* PROMOTE	+

* The positive coefficients for the satisfaction response variables were based on the coding of the responses (i.e., 1 = Satisfied, 5 = Dissatisfied). This means that the lower the response coding for this particular type of question, the more satisfied the respondent was with the topic of the question.

estimated coefficient (Beta). Table 4-2 presents the significant variables, P-values and level of significance.

TABLE 4-2

LIST OF SIGNIFICANT VARIABLES

<u>VARIABLE</u>	<u>P</u>
GRADE	.0003 *
MALE	.0426 **
NONW	.0649 ***
FREEDOM	.0001 *
PROMOTE	.0077 *

* Significant at the .01 level

** Significant at the .05 level

*** Significant at the .10 level

Appendix B includes statistics for the predicted probabilities given by the model. Sensitivity (8.7%) is the

proportion of true positives that were predicted to be positive. Specificity is the proportion of true negatives (98.4%) that were predicted to be negative. The false positive (46.7%) and false negative (16.7%) rates are also found within Appendix B.

Appendix C lists the correlation coefficients for variables used within the model. The variables Married and Children, Satisfaction with Promotion and Satisfaction with Freedom, Satisfaction with Promotion and Satisfaction with Pay, and Satisfaction with Pay and Satisfaction with Freedom showed high correlation (i.e., correlation .24 and greater) with each other, but not with the dependent variable (Leavers). For example, the variables Married and Children, both dealing with family responsibility, predicted the same degree of variation in the dependent variable.

B. ANALYSIS RESULTS

Career decision probabilities for non-obligated nurses were calculated at the mean values for all continuous explanatory variables (i.e., Grade, Freedom, Pay, Promote) used in the model. These probabilities represent the likelihood of the individual member's (in terms of average characteristics of the sample) decisions to leave the service.

Dummy variables (i.e., Male, Nonwhite, Children, Married) were used to make comparisons between subpopulations of the various groups. For example, female is

the reference gender, and the effect of being male, holding other characteristics constant, can be estimated by evaluating the logit equation using the coefficient of the male dummy variable and comparing the resultant likelihood of leaving with that of the reference (female) individual.

The effect on the likelihood of leaving of the continuous variables was calculated by increasing the respective mean by an increment of one unit at a time, with the exception of the satisfaction variables which were increased by one standard deviation, holding all other explanatory variables constant except the one under observation, to observe changes in the probability of leaving.

The results of the individual probability of a nurse leaving the military are presented in Table 4-3.

Those factors identified in Table 4-2 as significant in explaining the career decisions of a military, non-obligated nurse include GRADE, SATISFACTION WITH FREEDOM, SATISFACTION WITH PROMOTION, MALE and NON-WHITE.

Surprisingly, satisfaction with pay was not significant, but results indicate that, if significant, the more dissatisfied an individual was with pay, the less likely he/she would leave the military. The hypothesis predicted that greater dissatisfaction with pay would lead the individual toward not staying in the military. Perhaps the effects of satisfaction of pay were captured by the

TABLE 4-3

CAREER DECISION PROBABILITIES FOR NON-OBLIGATED NURSES

<u>Variables</u>	<u>Probability (Y=1)</u>	<u>Change in Reference Case Prob.</u>
Base Case	.165	
GRADE	.108	-.057
SATISFACTION WITH FREEDOM	.244	.079
SATISFACTION WITH PAY	.145	-.019
SATISFACTION WITH PROMOTION	.217	.052
MALE	.071	-.095
NONWHITE	.088	-.077
CHILDREN	.178	.013
MARRIED	.170	.005

satisfaction with promotion and/or satisfaction with freedom variables. (See Appendix C.)

Children was not significant. If significant, nurses having children with reference to those without children were more likely to leave the military. This may indicate that family life compared to a nursing career was more important to the individual.

Married was not significant. Results indicate that, if significant, married individuals with reference to single individuals were more likely to leave the military. Since the military is a disruptive force for the traditional family due to relocation or transfer, then individuals who

are married have a tendency to leave the service. The same reason may apply to nurses with children.

Grade was significant. As hypothesized, an increase in grade would result in a decrease in the probability that a nurse would leave the military. A higher grade would reflect greater work opportunities and more pay.

Satisfaction with freedom was significant. As hypothesized, the more dissatisfied an individual was with freedom, the more likely he/she would leave the military.

Satisfaction with promotion was significant. As hypothesized, the more dissatisfied an individual was with promotion, the more likely he/she would leave the military. This may suggest that these nurses were sensitive to promotion opportunities and the factors that determine them, such as fitness reports.

Male was significant. Males with reference to females were less likely to leave the military in FY87. As hypothesized, this may suggest that these males were indeed career oriented compared to females.

Non-white was significant. Non-whites with reference to whites were less likely to leave the military. As hypothesized, this may suggest that civilian opportunities for non-whites were not as good compared to those for whites.

Table 4-4 summarizes both significant and non-significant variables with their hypothesized and actual signs.

TABLE 4-4

SUMMARY OF HYPOTHESIZED AND ACTUAL SIGN OF VARIABLES

<u>VARIABLE</u>	<u>HYPOTHESIZED SIGN</u>	<u>ACTUAL SIGN</u>
GRADE	-	-
MALE	-	-
NONW	-	-
CHILDREN	-	+
MARRIED	-	+
FREEDOM	+	+
PAY	+	-
PROMOTE	+	+

V. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

The purpose of this study was to identify those factors which result in the career decision of a military nurse to remain in or leave the service. The results of this study may be used to assist in the recruitment of nurses and to modify existing policies for military nurses in order to reduce turnover and eventually result in a more efficient medical health care system. In conducting this study, the major research question asked was what factors influence a military nurse's decision to stay in or leave the service. In answering this question, the literature review and LOGIT analysis were used to analyze the career decisions of non-obligated, military nurses. The results indicate that factors such as satisfaction with personal freedom, satisfaction with promotion, grade, gender, and race were significant in explaining the career decisions of military nurses for FY87. Other factors such as marital status, dependents, education, and satisfaction with pay were not significant.

The turnover rate for FY87 for non-obligated military nurses was fairly low (17%). Replacement is the key issue here. A loss of 17% which is not made up by recruitment could strain military nursing resources. With the current

attrition rate in the civilian sector and the reported increase in military shortage, the potential for an increase in turnover exists. Such an increase in turnover would have a negative impact on force readiness. When there are not enough experienced nurses available to carry out the hospital's mission, the effectiveness of the service is diminished and the quality of medical care declines. Thus, if retention falls below than planned levels, force readiness may be impaired.

The LOGIT model developed in this study was presented as a potential starting point from which further analysis may evolve. Several conclusions can be drawn from this model. Satisfaction with personal freedom and satisfaction with promotion have been shown to have a high impact on a nurse's career decision. The importance of these satisfaction variables may be due in part to the consistency of organizational policies and work incentives. Any policies directed toward increasing satisfaction, many nurses should involve those factors.

Organizational policies may include working hours, duty assignments, shift rotations, or leave procedures. These policies directly affect the satisfaction with personal freedom and reasons for leaving. For example, fair assignments of extra duties and shift rotations, granting of leave, or more say on the working hours may improve satisfaction with personal freedom. If more nurses are

involved in the development and implementation of policies and procedures, they may be more committed to them, and thus be more work motivated at work and experience high job satisfaction.

Work incentives may include job security, pay, promotion, or retirement benefits. An individual's satisfaction with work incentive programs has been shown to be related to lower turnover rates. Job security and retirement programs provide individuals with one of their basic needs--the need for security. Promotion incentives provide avenues to increase an individual's self-esteem and self-actualization. The need exists for most individuals to perceive that they can gain greater self-esteem by accepting more responsibility. Self-actualization occurs as individuals become more important to the organization. Therefore, increasing work incentives for nurses should include the incorporation of these needs.

Gender and race were also significant variables in explaining the career decisions of military nurses. Males and non-whites were more apt to stay in the military compared to females and whites respectively. These findings may support increased recruiting and quota development for male and non-white nurses.

Fair and equitable treatment of nurses in regards to organizational policies, work incentives and an environment that provides internal motivation are important factors in

the career decisions of military nurses. It is logical that a satisfied nurse is a nurse who will remain with the organization.

B. RECOMMENDATIONS FOR FURTHER RESEARCH

Military nurses provide extremely valuable health care services to military communities throughout the world. Retention of these professionals is a priority issue. Factors identified in this research indicate a need for additional research on the career decisions of military nurses. In recommending areas for further research, the relative importance of factors and the impact these factors have on the career decisions of military nurses should be considered.

Other areas deserving further attention include:

- 1) The comparability of actual wages between military and civilian nurses.
- 2) The retention behavior of each branch of service.
- 3) The issues involving current nursing organizational policies.
- 4) The expectations of the newly recruited nurses--whether they are fulfilled or not, and what can be done if they are not fulfilled.
- 5) The promotion of nurses as compared to their line contemporaries. Is their time in service at advancement the same? Are the same percentage promoted? If not, does this disparity affect retention? Should the military consider forced retirement to open the way for upward mobility in the nurse corps?
- 6) The plausibility of developing programs to train qualified enlisted hospital corps personnel to become registered nurses.

- 7) Should the military look at growing their own nurses--through scholarships, through a special academy--what are the costs compared to the benefits?

Recruitment and replacement may be the most challenging element in the long-term strategy of retaining nurses in the military. Availability of quality medical care will suffer unless nursing turnover is limited. Reversing this trend toward a more restricted supply of military nurses would involve significant commitment from the Medical Chiefs, Secretary of Defense and Congress.

APPENDIX A

MEAN OBSERVATIONS

Dependent Variable: Leavers

517 Observations

425 Leavers = 0

92 Leavers = 1

VARIABLE	MEAN	MINIMUM	MAXIMUM	S.D.
GRADE	14.2824	14	17	0.503418
MALE	0.116054	0	1	0.3206
NONW	0.141199	0	1	0.348564
CHILDREN	0.44292	0	1	0.497215
MARRIED	0.595745	0	1	0.491223
FREEDOM	2.6383	1	5	1.08671
PAY	2.2205	1	5	0.852387
PROMOTE	2.74081	1	5	1.13717

APPENDIX B

LOGISTIC REGRESSION PROCEDURE

-2 LOG LIKELIHOOD FOR MODEL CONTAINING INTERCEPT ONLY* 484.19

MODEL CHI-SQUARE = 52.05 WITH 8 D.F. (SCORE STAT.)

P = 0.000.

CONVERGENCE IN 6 ITERATIONS WITH 0 STEP HALVINGS

R = 0.278

MAX ABSOLUTE DERIVATIVE = 0.5544D-12

-2 LOG L = 430.65

MODEL CHI-SQUARE = 53.54 WITH 8 D.F.

(-2 LOG L.R.) P = 0.0000.

VARIABLE	BETA	STD. ERROR	CHI SQUARE	P	R'
INTERCEPT	12.61914992	4.41082707	8.19	0.0042	
GRADE	-0.97343647	0.27176949	12.03	0.0003	-0.150
MALE	-0.95578269	0.47132882	4.11	0.0426	-0.066
NONW	-0.71954421	0.38982826	3.41	0.0649	-0.054
CHILDREN	0.09205592	0.27872432	0.11	0.7385	0.000
MARRIED	0.03578175	0.27895320	0.02	0.8979	0.000
FREEDOM	0.45203687	0.11371854	15.80	0.0001	0.169
PAY	-0.17762485	0.15259452	1.35	0.2444	0.000
PROMOTE	0.29652906	0.11123509	7.11	0.0077	0.103

CLASSIFICATION TABLE

PREDICTED

		NEGATIVE	POSITIVE	TOTAL
TRUE	NEGATIVE	418	7	425
	POSITIVE	84	8	92
	TOTAL	502	15	517

SENSITIVITY: 8.7% SPECIFICITY: 98.4% CORRECT: 82.4%
 FALSE POSITIVE RATE: 46.7%
 FALSE POSITIVE RATE: 16.7%

c = 0.750
 GAMMA = 0.484

SOMER DXY = 0.480
 TAU-A = 0.141

APPENDIX C

CORRELATION COEFFICIENTS

PEARSON CORRELATION COEFFICIENTS / PROB > IRI UNDER H0:RHO=0 / N = 517

	LEAVERS	GRADE	MALE	NONW	CHILDREN	MARRIED	FREEDOM	PAY	PROMOTE
LEAVERS	1.00000 0.0000	-0.17075 0.0001	-0.07385 0.0935	-0.04343 0.3244	-0.01782 0.6860	-0.00833 0.8501	0.22954 0.0001	-0.00170 0.9692	0.16402 0.0002
GRADE	-0.17075 0.0001	1.00000 0.0000	-0.14342 0.0011	-0.11724 0.0076	0.00256 0.9537	-0.02334 0.5964	-0.14946 0.0007	0.00816 0.8532	-0.07501 0.0884
MALE	-0.07385 0.0935	-0.14342 0.0011	1.00000 0.0000	-0.02553 0.5625	0.21183 0.0001	0.18773 0.0001	-0.02391 0.5876	0.11893 0.0068	0.05077 0.2492
NONW	-0.04343 0.3244	-0.11724 0.0076	-0.02553 0.5625	1.00000 0.0000	0.08572 0.0514	-0.08477 0.0541	0.08393 0.0565	0.07112 0.1062	0.04850 0.2710
CHILDREN	-0.01782 0.6860	0.00256 0.9537	0.21183 0.0001	0.08572 0.0514	1.00000 0.0000	0.42509 0.0001	-0.02213 0.6156	0.01145 0.7950	-0.05705 0.1952
MARRIED	-0.00833 0.8501	-0.02334 0.5964	0.18773 0.0001	-0.08477 0.0541	0.42509 0.0001	1.00000 0.0000	-0.08929 0.0424	-0.05978 0.1747	-0.04569 0.2998
FREEDOM	0.22954 0.0001	-0.14946 0.0007	-0.02391 0.5876	0.08393 0.0565	-0.02213 0.6156	-0.08929 0.0424	1.00000 0.0000	0.24320 0.0001	0.30978 0.0001
PAY	-0.00170 0.9692	0.00816 0.8532	0.11893 0.0068	0.07112 0.1062	0.01145 0.7950	-0.05978 0.1747	0.24320 0.0001	1.00000 0.0000	0.27902 0.0001
PROMOTE	0.16402 0.0002	-0.07501 0.0884	0.05077 0.2492	0.04850 0.2710	-0.05705 0.1952	-0.04569 0.2998	0.30978 0.0001	0.27902 0.0001	1.00000 0.0000

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